

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference <b>CEDE 2132.1</b>	<b>FOR FURTHER ACTION</b>		See item 4 below
International application No. <b>PCT/US2005/001999</b>	International filing date ( <i>day/month/year</i> ) <b>21 January 2005 (21.01.2005)</b>	Priority date ( <i>day/month/year</i> ) <b>21 January 2004 (21.01.2004)</b>	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant <b>ENTHONE INC.</b>			

1.	This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).																								
2.	This REPORT consists of a total of 6 sheets, including this cover sheet.  In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.																								
3.	<p>This report contains indications relating to the following items:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 10%; text-align: center;"><input checked="" type="checkbox"/></td> <td style="width: 30%;">Box No. I</td> <td style="width: 60%;">Basis of the report</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table>	<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input type="checkbox"/>	Box No. VII	Certain defects in the international application	<input type="checkbox"/>	Box No. VIII	Certain observations on the international application
<input checked="" type="checkbox"/>	Box No. I	Basis of the report																							
<input type="checkbox"/>	Box No. II	Priority																							
<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability																							
<input type="checkbox"/>	Box No. IV	Lack of unity of invention																							
<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement																							
<input type="checkbox"/>	Box No. VI	Certain documents cited																							
<input type="checkbox"/>	Box No. VII	Certain defects in the international application																							
<input type="checkbox"/>	Box No. VIII	Certain observations on the international application																							
4.	The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).																								

<p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No. +41 22 338 82 70</p>	<p>Date of issuance of this report <b>24 July 2006 (24.07.2006)</b></p> <p>Authorized officer  <b>Philippe Becamel</b></p> <p>e-mail: pt12@wipo.int</p>
--	---

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 28 JUL 2005

PCT

PCT

To:

see form PCT/ISA/220

*mk*

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2005/001999

International filing date (day/month/year)  
21.01.2005

Priority date (day/month/year)  
21.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H05K3/34, H01L23/495, H01R13/03, C25D5/12

Applicant  
ENTHONE INC.

**1. This opinion contains indications relating to the following items:**

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

**2. FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

**3. For further details, see notes to Form PCT/ISA/220.**

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Edmeades, M

Telephone No. +49 89 2399-2731



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/001999

---

**Box No. I Basis of the opinion**

---

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/001999

---

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

**1. Statement**

Novelty (N)	Yes: Claims	15,23
	No: Claims	1-14,16-22,24-27
Inventive step (IS)	Yes: Claims	
	No: Claims	15,23
Industrial applicability (IA)	Yes: Claims	1-27
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**SECTION V**

1. Reference is made to the following documents:

D1: US 2003/025182 A1 (ABYS JOSEPH A ET AL) 6 February 2003 (2003-02-06)

D2: US 2002/187364 A1 (HEBER JOCHEN ET AL) 12 December 2002 (2002-12-12)

D3: US-B1-6 613 451 (ASAHARA HAJIME ET AL) 2 September 2003 (2003-09-02)

2. D1 discloses (see whole document) a method comprising all of the features of claim 1: first metal layer 12; metal surface 10; tin-based coating 13 having a thickness greater than 0.5 microns (see par. [0022], where the tensile stress is also mentioned).

The additional features of claims 2,3,4,5,6,7,8,9,10,16-20,25 are known directly from D1.

3. D2 discloses (see paragraphs [0009] - [0023]) a method comprising all of the features of claim 1: first metal layer (underlayer) ; metal surface (substrate); tin-based coating having a thickness greater than 0.5 microns.

The additional features of claims 2,3,4,5,6,7,8,9,10,11,12,16-20,25 are known directly from D2.

4. D3 discloses (see Col.2, l.35 - Col.6, l. 64) a method comprising all of the features of claim 1: first metal layer ("intermediate layer") ; metal surface ("base metal"); tin-based coating having a thickness greater than 0.5 microns (see Col.6, l.48-49).

The additional features of claims 2,3,4,5,6,7,8,9,10,12,13,14,16-20,21,22,24,25,26,27 are known directly from D3.

5. Claims 15,23

The skilled person following the teaching of D3 would provide the claimed solution without the requirement of an inventive step, because in order to provide a layer of

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2005/001999

nickel with 0.05% - 20% P content, it would be necessary to provide an electrodeposition bath having an amount of p-based additive of the order claimed.

**Further Observations:**

1. The presence of a plurality of independent claims in the same category means that the claims as a whole are not concise. In the present case a single independent claim in any category is appropriate.
2. The claims are inconsistent. The specified thickness of the tin layer is different in the different independent claims. Hence the claims are inconsistent.

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

REC'D 28 JUL 2005

PCT

PCT

To:

see form PCT/ISA/220

*mk*

## WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing  
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference  
see form PCT/ISA/220

**FOR FURTHER ACTION**  
See paragraph 2 below

International application No.  
PCT/US2005/001999

International filing date (day/month/year)  
21.01.2005

Priority date (day/month/year)  
21.01.2004

International Patent Classification (IPC) or both national classification and IPC  
H05K3/34, H01L23/495, H01R13/03, C25D5/12

Applicant  
ENTHON INC.

### 1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

### 2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1b/s(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

### 3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office  
D-80298 Munich  
Tel. +49 89 2399 - 0 Tx: 523656 epmu d  
Fax: +49 89 2399 - 4465

Authorized Officer

Edmeades, M

Telephone No. +49 89 2399-2731



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/001999

---

**Box No. I Basis of the opinion**

---

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
  - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material:
    - ☐ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material:
    - ☐ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing:
    - ☐ contained in the international application as filed.
    - ☐ filed together with the international application in computer readable form.
    - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:



**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.  
PCT/US2005/001999

---

**Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

---

**1. Statement**

Novelty (N)	Yes: Claims	15,23
	No: Claims	1-14,16-22,24-27
Inventive step (IS)	Yes: Claims	
	No: Claims	15,23
Industrial applicability (IA)	Yes: Claims	1-27
	No: Claims	

**2. Citations and explanations**

**see separate sheet**

**SECTION V**

1. Reference is made to the following documents:

D1: US 2003/025182 A1 (ABYS JOSEPH A ET AL) 6 February 2003 (2003-02-06)

D2: US 2002/187364 A1 (HEBER JOCHEN ET AL) 12 December 2002 (2002-12-12)

D3: US-B1-6 613 451 (ASAHARA HAJIME ET AL) 2 September 2003 (2003-09-02)

2. D1 discloses (see whole document) a method comprising all of the features of claim 1: first metal layer 12; metal surface 10; tin-based coating 13 having a thickness greater than 0.5 microns (see par. [0022], where the tensile stress is also mentioned).

The additional features of claims 2,3,4,5,6,7,8,9,10,16-20,25 are known directly from D1.

3. D2 discloses (see paragraphs [0009] - [0023]) a method comprising all of the features of claim 1: first metal layer (underlayer) ; metal surface (substrate); tin-based coating having a thickness greater than 0.5 microns.

The additional features of claims 2,3,4,5,6,7,8,9,10,11,12,16-20,25 are known directly from D2.

4. D3 discloses (see Col.2, l.35 - Col.6, l. 64) a method comprising all of the features of claim 1: first metal layer ("intermediate layer") ; metal surface ("base metal"); tin-based coating having a thickness greater than 0.5 microns (see Col.6, l.48-49).

The additional features of claims 2,3,4,5,6,7,8,9,10,12,13,14,16-20,21,22,24,25,26,27 are known directly from D3.

5. Claims 15,23

The skilled person following the teaching of D3 would provide the claimed solution without the requirement of an inventive step, because in order to provide a layer of

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING  
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/US2005/001999

nickel with 0.05% - 20% P content, it would be necessary to provide an electrodeposition bath having an amount of p-based additive of the order claimed.

**Further Observations:**

1. The presence of a plurality of independent claims in the same category means that the claims as a whole are not concise. In the present case a single independent claim in any category is appropriate.
2. The claims are inconsistent. The specified thickness of the tin layer is different in the different independent claims. Hence the claims are inconsistent.

From the INTERNATIONAL BUREAU

**PCT**NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

Date of mailing (day/month/year) 01 February 2006 (01.02.2006)		To:  FLEISCHUT, Paul, I.J. Senniger Powers 1 Metropolitan Square 16th Floor St. Louis, MO 63102 ETATS-UNIS D'AMERIQUE
Applicant's or agent's file reference CEDE 2132.1		
International application No. PCT/US2005/001999	International filing date (day/month/year) 21 January 2005 (21.01.2005)	
International publication date (day/month/year) 11 August 2005 (11.08.2005)	Priority date (day/month/year) 21 January 2004 (21.01.2004)	
Applicant ENTHONE INC. et al		

1. By means of this Form, which replaces any previously issued notification concerning submission or transmittal of priority documents, the applicant is hereby notified of the date of receipt by the International Bureau of the priority document(s) relating to all earlier application(s) whose priority is claimed. Unless otherwise indicated by the letters "NR", in the right-hand column or by an asterisk appearing next to a date of receipt, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).

2. (If applicable) The letters "NR" appearing in the right-hand column denote a priority document which, on the date of mailing of this Form, had not yet been received by the International Bureau under Rule 17.1(a) or (b). Where, under Rule 17.1(a), the priority document must be submitted by the applicant to the receiving Office or the International Bureau, but the applicant fails to submit the priority document within the applicable time limit under that Rule, the attention of the applicant is directed to Rule 17.1(c) which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

3. (If applicable) An asterisk (\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b) (the priority document was received after the time limit prescribed in Rule 17.1(a) or the request to prepare and transmit the priority document was submitted to the receiving Office after the applicable time limit under Rule 17.1(b)). Even though the priority document was not furnished in compliance with Rule 17.1(a) or (b), the International Bureau will nevertheless transmit a copy of the document to the designated Offices, for their consideration. In case such a copy is not accepted by the designated Office as the priority document, Rule 17.1(c) provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

Priority date	Priority application No.	Country or regional Office or PCT receiving Office	Date of receipt of priority document
21 January 2004 (21.01.2004)	102004002982.2	DE	13 June 2005 (13.06.2005)
04 May 2004 (04.05.2004)	10/838,571	US	03 March 2005 (03.03.2005)
19 October 2004 (19.10.2004)	10/968,500	US	03 March 2005 (03.03.2005)

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Carlos Roy - Gijsbertus Beijer

Facsimile No. +41 22 338 82 70

Facsimile No. +41 22 740 14 35  
Telephone No. +41 22 338 95 61